Expert Report of Joshua Lipton, PhD

ASARCO LLC Chapter 11 Bankruptcy

Case No. 05-21207

Coeur d'Alene Basin, Idaho

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A. Introduction

This report contains the opinions of Joshua Lipton, PhD, regarding natural resource damages at the Coeur d'Alene Basin Superfund Site in Idaho. The opinions presented in this report address natural resource damages over the period 1981 forward for all federal natural resources, including damages to aquatic resources such as surface water and fisheries, federal lands, and tundra swans and their habitat.

B. Expert Qualifications

I am the CEO and President of Stratus Consulting Inc. I also direct our firm's work in environmental sciences and natural resources, and in natural resource damage assessment (NRDA). I also hold an appointment as Research Professor (rank of full Professor) in the Department of Geochemistry at the Colorado School of Mines in Golden, Colorado. I have previously submitted an expert report to this bankruptcy court related to the California Gulch Superfund Site. That report contains a copy of my resume and details my expert qualifications.

In addition to the general qualifications listed in my California Gulch report, I have extensive experience working at the Coeur d'Alene site, going back to the early 1990s. That experience includes performing injury assessment work, preparing a Report of Injury Assessment and Injury Determination, and testifying in deposition and at trial regarding natural resource injuries during the first phase of the natural resource damages trial (which addressed liability and natural

resource injuries). During the second phase of the case, which relates to natural resource damages, I prepared several additional expert reports:

- Damages Calculation for Aquatic Resources: Coeur d'Alene Basin Natural Resource Damage Assessment. Prepared with D. Chapman, G. Koonce, and F. Rahel. August 20, 2004.

- Summary of Damages Calculations: Coeur d'Alene Basin Natural Resource Damage Assessment Summary Report. Prepared with D. Chapman and K. LeJeune. August 20, 2004.

- Rebuttal Expert Report. October 15, 2004.

- Supplemental Expert Report. Prepared with K. LeJeune and D. Chapman. November 9, 2004.

I have been deposed by the defendants, including Asarco, regarding each of these expert reports. In addition to these reports, Katherine LeJeune and David Chapman (both of my firm) and Greg Koonce prepared an expert report titled "Damages Calculation for Federal Lands: Coeur d'Alene Basin Natural Resource Damage Assessment." The information in this report was contained and summarized in the "Summary of Damages Calculations" and "Supplemental Expert Report." I also submitted a declaration on June 22, 2005, that contained my opinions regarding the trustees' use of standard methods and consideration of the U.S. Environmental Protection

Agency's (EPA's) remedial actions. Each of these documents is contained as an attachment to this current expert report.

I have previously been qualified as an expert in environmental toxicology and NRDA in State of Montana v. Atlantic Richfield Company, CV-83-817-HLN-PGH, United States District Court for the District of Montana, and have testified in deposition and at trial regarding natural resource damages in the Coeur d'Alene Basin NRDA (United States v. Asarco et al., No. 96-0122-N-EJL and No. 91-0342-N-EJL). I also testified as the United States' 30(b)(6) expert on natural resource damages in the Coeur d'Alene NRDA. I testified at trial as an expert in U.S. District Court in Portland, Oregon, in United States v. The New Portland Meadows Inc., et al. (CV-00-507-KI).

My firm's compensation for the preparation of this report and other related activities is approximately $35,000.

C. Summary of Work Performed to Calculate Natural Resource Damages at the Coeur d'Alene Superfund Site

The Coeur d'Alene NRDA is one of the most comprehensive NRDAs ever performed. It comprises extensive sampling and analysis, regulatory determinations, expert reports, and deposition and trial testimony covering releases of hazardous substances and liability for those releases; pathways by which the released hazardous substances have been transported in the environment; exposure of natural resources to hazardous substances; injuries to natural resources; and natural resource damages. In calculating natural resource damages for the Coeur

d'Alene Site, I have relied on the decades of investigations and analyses performed at the site, as well as on the 15 years of NRDA work that has been completed by the trustees. The specific sources of data are identified as "Literature Cited" in the individual expert reports attached to this report.

D. Use of the U.S. Department of the Interior Regulations

As I stated in my expert report for the California Gulch site, damages for injuries to natural resources caused by releases of hazardous substances can be recovered by public trustees pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), commonly known as the "Superfund" Act. The U.S. Department of the Interior (DOI) has promulgated regulations for conducting NRDAs. These regulations are found at 43 CFR Part 11. The application of these regulations is not mandatory, and natural resource trustees have the option of diverging from them as appropriate (43 CFR § 11.10).

Notwithstanding the optional nature of the DOI regulations, the Coeur d'Alene trustees relied on guidance provided in those regulations in assessing natural resource damages. See, e.g., Report of Injury Assessment and Injury Determination (LeJeune et al., 2000, attached hereto). See, also, Trial Exhibits 1904, 1925.

During the first phase of the Coeur d'Alene case, the trustees relied on guidance and used several of the specific criteria outlined in the DOI regulations. For example, the trustees followed DOI guidance in assessing natural resource injuries (43 CFR § 11.62), determining transport pathways

(43 CFR §11.63), and evaluating baseline conditions [43 CFR § 11.70(a); 43 CFR § 11.72]. These elements were described in detail in the Report of Injury Assessment and Injury Determination (LeJeune et al., 2000).

During the subsequent damage determination phase of this case, the trustees again relied on the DOI regulations to inform their choice of assessment methodologies and to serve as a coherent and recognized basis for assessment. For example, the DOI regulations [e.g., 43 CFR § 11.80(b); 43 CFR § 11.82; 43 CFR § 11.83] were used as the basis for the approaches used to calculate natural resource damages, including calculations of the costs of restoration, replacement, and acquisition of services. Each of these methods is identified in the DOI regulations as appropriate procedures for the calculation of natural resource damages.

As stated in those regulations, "the measure of damages is the cost of restoration, rehabilitation, replacement, and/or acquisition of the equivalent of the injured natural resources and the services those resources provide" [43 CFR § 11.80(b)]. In addition, the regulations indicate that trustees can seek damages for lost services from the onset of injury until natural resources and their services have been restored to baseline conditions. In other words, there are two components of natural resource damages: (1) the restoration of injured resources to baseline conditions, and (2) the compensatory restoration to account for lost services in the past, present, and future until the natural resources have been restored to baseline.

Consistent with the DOI regulations, the natural resource damages calculated by the trustees included several alternatives, including the cost of restoration, the cost of acquisition, and service replacement costs (Lipton et al., 2004a, p. 6-9).

In addition to natural resource damages, response costs have been and will be incurred by EPA and other federal and state agencies. These response costs are not part of natural resource damages, but the response activities are taken into account in the damage calculations, as described below.

E. Summary of Approach to Calculating Damages

To calculate natural resource damages for the Coeur d'Alene Site, several approaches were used. The first approach used by the trustees to calculate damages is the cost to restore injured resources to baseline through additional cleanup and management actions beyond those currently planned by EPA as described in their 2002 Record of Decision (ROD). This restoration cost approach takes into account EPA's planned remedy by only looking at costs for incremental restoration actions necessary to restore injured resources to baseline conditions.

Another element of the damage calculations is the compensatory restoration to address past, present, and future injuries and service losses. The trustees calculated these natural resource damages using the cost to replace or acquire the equivalent of the injured resources (LeJeune et al., 2004; Lipton et al., 2004b; Trost, 2004).

Replacement and acquisition costs are calculated for several different time periods: past damages, damages from the present until the start of EPA's remedy, damages during the 30-year period over which EPA's remedy is anticipated, and residual damages after completion of EPA's remedy. The approach used by the trustees in this case is consistent with that used by trustees and responsible parties at many other sites in the United States.

As mentioned above, the trustees' natural resource damage calculations take into account EPA's remedial actions. First, there is no relationship between EPA's interim remedy and past damages because the past damages occurred prior to the initiation of remedial actions. As a result, past damages can be calculated without any uncertainties regarding the effect of response actions on damages. In calculating damages from the present until the start of and during the period of EPA's remedy, the trustees relied on EPA's published estimates, from the ROD, of the remediation period and the anticipated efficacy of the response actions. Similarly, the trustees took into account EPA's remedy in calculating future residual damages (after completion of the remedy) by relying upon the information provided in the ROD.

Replacement and acquisition costs are calculated using standardized and accepted procedures of discounting to calculate present values. That is, using a discount rate, past damages are represented in present value terms by applying a multiplier, whereas future damages are discounted to present value terms. Because of this discounting process, future damages are worth less, in present value terms, than past or current damages. The further into the future the discounting is applied, the lower the present value of the discounted damages.

There is a potential relationship between future damages that occur after EPA's interim remedy and any future response actions that might be taken. The trustees' calculations assume that no additional response actions will be undertaken in the next 30 years other than those identified in the ROD. If EPA were to conduct additional response actions beyond those currently contemplated, the trustees' calculations of *future* damages – that is, the portion of damages that occurs after the interim remedy is complete – conceivably could be overestimated. However, EPA's ROD assumes a 30-year implementation period. That means that any possible overestimates of future damages will only apply to time periods more than 30 years in the future. Because of the principles of discounting I discussed previously, the present value of damages more than 30 years in the future makes up only a very small component of total damages.

Based on the foregoing, it is my opinion that the trustees took into account EPA's interim remedy in calculating damages, and that any uncertainties regarding potential additional EPA response actions following completion of the interim remedy would have little or no influence on the trustees' damage calculations.

F. Summary of Natural Resources Damages at the Coeur d'Alene Site

In Lipton et al. (2004a), I provided a summary of natural resource damages for the Coeur d'Alene Site. In that summary, I showed that restoration costs range from a low estimate of $143.7 million to $839.5 million.[1] The low estimate does not actually represent total damages

1. All damages were presented in 2004$.

because it represents a "management alternative" under which hazardous substances are managed in place but natural resources are not restored. I also presented damage calculations based on replacement or acquisition costs for aquatic resources. Using the service replacement alternative (which employed a resource equivalency approach), damages to aquatic resources ranged from $64.4 million to $192 million. Using the acquisition approach, damages to aquatic resources ranged from $302.7 to $329.8 million. The summary report also described damages to federal lands as ranging from $59.7 to $104 million using equivalency approaches, and $92.8 million for on-site restoration. Finally, the summary report presents damages to injured tundra swans using a mixture of on-site restoration and resource equivalency approaches. Those damages equaled $183.5 million.

On November 9, 2004, I submitted a supplemental expert report addressing certain aspects of the natural resource damage calculations. Specifically, I updated calculations to address the potential overlap in aquatic and riparian services that could be generated from implementing some of the restoration actions described in the earlier expert reports. I also updated the costs to conduct riparian habitat restoration actions. The revised range of damages was $58.2 to $101 million, a very slight decrease from the initial values.

G. Total Natural Resource Damages

Because the trustees used several different approaches to calculating damages, total natural resource damages also can be calculated several ways. Table 1 presents alternative approaches to calculating total damages.

Each of the methods presented in Table 1 is an appropriate approach to calculating damages. The on-site restoration approach is the most expensive of the three methods because the amount of effort required to restore the grossly injured habitats of the Coeur d'Alene Basin is extremely costly. This approach also is the only method that will truly restore injured natural resources to something approaching baseline conditions. The service replacement approach, in which habitat and resource equivalency methods were used to calculate the cost of restoring other natural resources as compensation for the injuries in the Coeur d'Alene Basin, is the least expensive approach. This approach is commonly used by trustees around the United States (and internationally) to calculate natural resource damages. Although the off-site restoration actions that will be undertaken using this approach are scaled to compensate for the extensive on-site injuries, the approach will not make the injured environment whole. In fact, total damages at the site are equal to the costs of primary restoration *plus* the costs of compensatory service replacement (Method 1 *plus* either Method 2 or Method 3; but taking into account any overlap in

Table 1. Alternative approaches to calculating total natural resource damages from individual damage components

Cost component	Damages (2004$)
Method 1: On-Site Restoration Approach	
Comprehensive restoration	$839.5 million
Staged restoration	$643.5 million
Restoration of Federal lands + Coeur d'Alene Lake management	$382 million
Range: $382-$839.5 million	
Method 2: Water Acquisition + Federal Lands + Swans	
Water acquisition	$302.7-$329.8 million
Federal lands (service replacement)	$58.2-$101 million
Swans (service replacement and habitat restoration)	$183.5 million
Range: $544.4-$614.3 million	
Method 3: Service Replacement	
Aquatics	$69.5-$192 million
Federal lands	$58.2-$101 million
Swans	$183.5 million
Savings through riparian restoration	($7.2-$12.5 million)
Range: $304-$463 million	

restoration actions and subtracting those costs from the total).[2] As a result, I conclude that natural resource damages for the Coeur d'Alene Superfund Site are at least $304 million, as calculated in 2004$.

2. For example, there are certain similar restoration actions described in the comprehensive restoration alternative of Method 1, and the swan restoration projects in Methods 2 and 3. I did not attempt to separate out potentially overlapping projects to develop a true total cost of primary restoration and compensatory service replacement.

Finally, the trustees' claim for natural resource damages also should include their assessment costs, as outlined in the DOI regulations. Therefore, total damages are equal to the amounts presented above plus federal assessment costs.

H. Anticipated Exhibits to be Used at Trial

I anticipate that some or all of the following exhibits may be used at trial to support my testimony:

- This expert report, including any figures or tables, as well as any attachments thereto
- The Report of Injury Assessment and Injury Determination (LeJeune et al., 2000), including any figures or tables contained therein
- Any of the expert reports prepared as part of the Coeur d'Alene NRDA, including any figures or tables contained therein
- Any of the trial exhibits used in that case
- Illustrative maps of the Coeur d'Alene Superfund Site and those locations included in my calculations of damages
- Graphics illustrating the NRDA process
- Charts showing the relationship between natural resource damages and remedial cleanup costs

- Graphics illustrating the DOI regulations
- Illustratives demonstrating the habitat and resource equivalency methods
- Photographs of the site
- Photographs and/or illustrative drawings of natural resources of the site
- Illustratives describing the calculations of debits or credits in equivalency models
- Charts summarizing natural resource damages calculated for the site.

I. Literature Cited

LeJeune, K., D. Chapman, and G. Koonce. 2004. Damages Calculation for Federal Lands: Coeur d'Alene Basin Natural Resource Damage Assessment. Prepared for United States Department of the Interior, Bureau of Land Management, United States Department of Agriculture, Forest Service, Coeur d'Alene Tribe. August 20.

LeJeune, K., T. Podrabsky, J. Lipton, D. Cacela, A. Maest, and D. Beltman. 2000. Report of Injury Assessment and Injury Determination: Coeur d'Alene Basin Natural Resource Damage Assessment. Report prepared for U.S. Department of the Interior, Fish and Wildlife Service; U.S. Department of Agriculture, Forest Service; Coeur d'Alene Tribe. Trial Exhibit 57.

Lipton, J., D. Chapman, and K. LeJeune. 2004a. Summary of Damages Calculations: Coeur d'Alene Basin Natural Resource Damage Assessment Summary Report. Expert Report of August 20, 2004.

Lipton, J., D. Chapman, G. Koonce, and F. Rahel. 2004b. Damages Calculations for Aquatic Resources: Coeur d'Alene Basin Natural Resource Damage Assessment. Expert Report of August 20, 2004.

Trost, R.E. 2004. Tundra swan (*Cygnus columbianus*) Injury Assessment: Lower Coeur d'Alene River basin. Expert Report of August 20, 2004.

J. Other Documents Relied Upon

Documents consulted in the process of conducting the work described in this expert report include, but may not be limited to, the references cited above, other citations identified in the attachments to this report, citations identified in the Report of Injury Assessment and Injury Determination (LeJeune et al., 2000), as well as various trial exhibits.